REQUIRED: Curiosity And An Inquiring Mind

NAVIGATING THE LINK BETWEEN INFECTION AND CANCER

By George Fuller

Photography: Ray Reyes

Anna R. Giuliano, Ph.D.
“She was always thinking outside of the box, breaking rules, and only following what her heart told her was right.”

— Shannon A. Thompson, November Snow

This past December, the U.S. Food and Drug Administration approved an eagerly awaited vaccine that protects against nine types of human papillomavirus (HPV) with the potential to increase overall cervical cancer prevention from 70 to 90 percent, nearly eliminating this cancer altogether. The vaccine was Gardasil 9. The leader of the team at the Moffitt Cancer Center was researcher Anna R. Giuliano, Ph.D., director of the Center for Infection Research in Cancer (CIRC) at Moffitt. A February 19 research report in the New England Journal of Medicine will tell you more about Gardasil 9 and the research leading to its licensure. But it won’t shed any light on Dr. Giuliano. It won’t tell you about the pluck and grit it takes to champion a cause such as this. It won’t tell you what it takes to be a world-class researcher. Keep reading. You’ll meet a multifaceted nonconformist who embraces the attributes of a true researcher.

Dr. Giuliano At A Glance

Anna R. Giuliano, Ph.D., is a senior member in Cancer Epidemiology and founding director of the Center for Infection Research in Cancer (CIRC) at Moffitt Cancer Center. Her research focuses on infectious diseases and their causal relationships with various cancers. Most recently it has centered on the relationship between human papillomavirus (HPV) infections and cervical cancer in women and HPV and penile, anal, and oropharyngeal cancers in men.

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AN INTEREST BEYOND THE CASUAL

“I know this is going to sound crazy, but ...” Dr. Giuliano sprinkles these words throughout a recounting of her path to where she is today as casually as many of us sprinkle salt on french fries. But nothing she says sounds crazy. Intense. Focused. Unconventional. Offbeat in an inventive way. But not crazy.

Here’s one example: “I started out on violin. I thought I was going to Juilliard after high school, but I realized that wasn’t going to happen.”

So she veered away.

“I’d always had an interest in populations, in culture and what drives people to behave a certain way, why they believe what they believe.”

Well, OK, granted that might sound a little crazy to the kid sitting next to you at a high school football game. But no matter. Hers was a population game and her interest in it only intensified from that point, becoming more focused and morphing into something even more offbeat as school progressed. As an undergraduate at the State University of New York at Stony Brook working on a B.A. in psychology, she had an inkling that it would make perfect sense to roll everything she loved
— populations, culture, biology, the cultural differences in diet and how all those factors affect health — into one study. Voilà, nutrition. So when she finished her B.A. in psychology, she went to Tufts University and earned a Ph.D. in nutritional biochemistry. As we said, her interests would never have been described as casual.

But back to Stony Brook.

While some of her classmates wondered what they were going to do on Saturday night, she was mulling over other types of questions. How do we define abnormality? When does memory first occur? How does one imagine where one is in physical space? How do you evaluate a cognitive map? What is schizophrenia besides a construct of the developed world’s way of thinking? Speaking of thinking, she seemed to be redlining her brain with regularity.

“Cognitive and behavioral psychology were big at the time,” the psychology/anthropology double major remembers. “So were the studies of culture and population diversity. But I was more interested in probing the origins of the disease than sitting down with people to talk.”

Dr. Giuliano describes how she had spent three years working as an educational counselor. It was enough to make her realize she didn’t want to become a clinical psychologist. She really was most comfortable in an academic setting. She loved examining groups of people, and she was good at research. Really good.

She muses, “Sometimes the study is more interesting than the practice. I preferred to study, so I had to rethink everything.”

COMMITMENT LIKE A SOLEMN OATH

“In January of 2012, we started the Center for Infection Research in Cancer here at Moffitt. The idea was to look deeply to find the link between infections and cancer.”

A sharp decision it was. Infection is the cause of nearly 2 million cancer cases a year, accounting for 18 percent of the worldwide cancer burden. Each year, this number increases as new cancer-causing infectious agents are identified.

Most infections can be prevented with vaccines and treated with antivirals and antibiotics, providing an extraordinary opportunity to eradicate certain cancers. In 1995, HPV was thought to cause only cervical cancer. In 2005, evidence indicated that HPV causes multiple cancers. Today, with just one vaccine, it is possible to prevent four types of cancer affecting both women and men.

Thus, CIRC was launched with the purpose of revealing the role of various infectious agents in the origin of cancer and translating that knowledge into novel and effective strategies for the prevention and treatment of cancer.

So why Moffitt? Dr. Giuliano jumps on the answer faster than a Tesla with something to prove. “Moffitt’s commitment. They applied no constraints to what I wanted to do with the CIRC. Their commitment allowed me to be as creative as I wanted to be.”

For someone with a curiosity as ferocious as Dr. Giuliano’s, boundaries would only inhibit.

Moffitt was smart to recognize that.

CIRC brings together Moffitt’s strengths in laboratory, clinical and population sciences, along with ongoing specimen and data collection through Moffitt Total Cancer Care®, to promote a cohesive, transdisciplinary research effort to better understand the relationship between certain infections and the tumors they cause. Through work with the HPV vaccine, Moffitt has demonstrated its expertise and success in moving research on an infectious agent from the bench to vaccine FDA licensure and, ultimately, to the population.

Dr. Giuliano doesn’t do well with rules and controlling regulations.

“My advisor at Tufts said, yes, he could see me in the military, but I’d have to be the general,” she laughs. “In science, there are very few opportunities to work where no one is saying you have to do this or that. But I work best in that kind of environment. I’m constantly questioning.”
Moffitt has given Dr. Giuliano a place where she can create based on sound principles rather than a demanding bureaucracy.

“The questioning part is most important. Why do you believe that it’s this and not that? Maybe we’ve all jumped onto a bandwagon that’s stopped us from finding something important. Believing the results of a researcher because that researcher is ‘famous’ happens all the time, but it’s grossly unproductive.”

Deep humility in the face of success.

Dr. Giuliano has an unpretentious demeanor and is someone you could have fun with while watching a baseball game. Though she’s undoubtedly excelled in research science and academia, and has accolades that bear witness, she exhibits no air of superiority. Not a hint. To her, humility is on equal footing with intelligence. But unlike intelligence, humility is something she set out to learn.

“There are different people I model myself after for different reasons.”

Some have an amazing sense of people. When you walk into their offices, no one else exists except you. Then there are the hyper-brilliant scientists with every right to be aloof but, in fact, are just the opposite.”

Here’s another way humility plays out. “If there’s one key role I play, it’s to inspire the people I work with to do the research they think is most important. You have to see Moffitt. All these young people — excited. The opportunity to create your vision without having to go through layers of bureaucracy.”

She clearly aims to excel past the barrier of expectations. Even her own. No, contentment does not seem to have a home in her wheelhouse.

“There are so many viruses that cause cancer.”

And she’s out to find them all. There’s HPV, which has been discovered to cause multiple cancers in both men and women. There are various strains of Epstein Barr virus and how they may be related to different types of cancer. Helicobacter pylori and stomach cancer. Then there are viruses we’re not sure about. Ones we think might cause cancer. Ones that present with compelling evidence but not enough to make a definitive statement.

“At Moffitt, we have researchers working with viruses and bacteria we know cause cancer and trying to figure out ways to thwart them. We have researchers working on viruses that are suspicious. There are so few of us around the world that we have to collaborate rather than compete. People really don’t expect that.”

CIRC has strategic partners from across the U.S. and around the world.

An unrelenting thirst for knowledge.

“I joke with students and say, once a paper is published, I never look at it again. I can’t remember it. I’m so busy moving forward to investigate all the gaps of knowledge we need to fill. I keep seeing the work we need to do.”

Hers is a thirst that even eight glasses of indisputable facts a day wouldn’t quench.

“My day is divided between running the CIRC, scheduling seminars, raising money and managing my own research portfolio, an international one focused on HPV infection. Then I have educational activities: a Fogarty Training Grant for epidemiology in Morocco, a Senior Scholar award that supports me to mentor junior faculty, things like that.”

She takes a breath when she’s rooting for her son, who’s on the baseball team at Tampa Prep. Or when she’s admiring one of her husband/sculptor’s new pieces.

If indeed you can believe she ever takes a breath.

Understanding The Connection Between Infectious Agents And Cancer

“Vaccination is a key area of cancer prevention, and the advent of the HPV vaccine has been instrumental in preventing cervical cancer,” says Paul Jacobsen, Ph.D., associate center director, Division of Population Science.

Dr. Giuliano has served as principal investigator of record for numerous trials with the 4-valent Gardasil vaccine in both men and women, as well as studies that showed efficacy against HPV infection and disease in men.

“In particular, she was the lead author of what is called the EVRI study,” Dr. Jacobsen says. “That clinical trial assessed and demonstrated the feasibility of providing HPV vaccination to young women in South Africa who were at high risk of HIV to see if the vaccine can prevent both HIV- and HPV-related endpoints.”

The Center for Infection Research in Cancer at Moffitt, which Dr. Giuliano directs, explores not only the connection between viruses such as HPV and cancer but also the connection between infection with numerous other pathogens and the associated risk of developing other forms of cancer. One such example is the connection between infection with Helicobacter pylori bacteria and stomach cancer.

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